

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

TWO NEW GOPHERS (MAMMALIAN GENUS
THOMOMYS) FROM WESTERN UTAH.

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In the course of a study of the pocket gophers of Utah, comparisons have revealed that the animals from Clear Lake, in Delta Valley, and those from Stansbury Island, Great Salt Lake, represent two unnamed subspecies of *Thomomys bottae*. The diagnoses are as follows:

Thomomys bottae convexus, subsp. nov.

Type.—Male adult, skin and skull, No. 2482, Museum of Zoology, University of Utah; E. side Clear Lake, 4600 ft., Millard County, Utah; May 20, 1938; collected by S. D. Durrant; original No. 1401.

Range.—Western Utah, in Delta Valley, limits of range unknown.

Diagnosis.—Size medium (see measurements); Color: Upper parts and sides Pinkish Buff, lighter on sides; under parts Pale Pinkish Cinnamon; inguinal and pectoral regions Pale Pinkish Buff; post auricular patches black; nose grayish black; nearly all specimens have white on perineal region. (Capitalized color terms according to Ridgway, Color Standards and Color Nomenclature, Washington, D. C., 1912). Skull: Brain case moderately convex on dorsal surface; rostrum strongly depressed, giving the entire dorsal surface of the skull a "rocker-shape"; zygomatic arches heavy, wide-spreading and widest posteriorly; upper incisors recurved, short and heavy; molars large; alveolar length of upper molar series long; palatal pits deep; foramen magnum quadrangular; auditory bullae moderately inflated, the ventral part extending well ventrad of the basioccipital, and angular on anteriolateral margin; mastoidal breadth relatively and actually wide; interpterygoid space "V"-shaped.

Measurements.—The average and extreme measurements of six adult males and 11 adult females from the type locality are, respectively, as follows: Total length, 212.8 mm. (233-206), 196.8 (204-182); tail vertebrae, 59.3 (68-57), 57.4 (63-43); hind foot, 28.2 (29-27), 26.8 (28-26); ear from notch 4, 4. Skull: basilar length of Hensel, 33.1 (35.0-31.3), 29.9 (30.9-27.9); greatest length of nasals, 14.3 (14.6-13.9), 12.5 (13.4-11.2); zygomatic breadth, 24.9 (26.7-23.8), 21.7 (22.3-21.0); mastoidal breadth, 21.4 (22.0-20.7), 19.3 (19.8-18.8); interorbital breadth, 6.6 (6.8-6.5), 6.6

(7.1-6.2); alveolar length of upper molar series, 8.0 (8.1-7.7), 7.7 (7.9-7.1); extension of premaxillae posterior to nasals, 2.6 (2.8-2.1), 2.6 (3.1-2.1); length of rostrum, 16.2 (17.2-15.2), 14.7 (15.2-13.3); breadth of rostrum, 8.2 (8.6-8.0), 7.4 (7.7-7.1); width of upper incisors at cutting edge, 4.5 (4.7-4.3), 4.0 (4.5-3.8).

Comparisons.—Compared with topotypes of *T. b. wahwahensis* this form is of nearly the same color but lighter throughout. It differs in having the rostrum much more depressed; top of skull convex rather than nearly flat; nasals convex rather than straight; brain case more inflated; auditory bullae larger; foramen magnum nearly quadrangular as opposed to circular; alveolar length of upper molar series longer; molars actually larger; angle of upper incisors and palatine processes of premaxillae more acute; zygomatic arch stronger and wider, especially the zygomatic process of the maxillae.

Compared with topotypes of *T. b. centralis*, these gophers are of nearly the same color but uniformly lighter throughout. This coloration is further significant because both series were taken in May, those of *centralis* on May 28, and those of *convexus* on May 20. *T. b. convexus* shows a nearly uniform white patch on the perineal region, while this color is uniformly lacking in *centralis*. Skull: Smaller and flatter; rostrum much shorter, broader and more depressed; upper incisors wider and markedly shorter; palatal pits much deeper; basioccipital wider, not as "T"-shaped, and less expanded at junction with basisphenoid; auditory bullae more inflated; maxillary plate of zygomatic arch more nearly vertical.

Compared with topotypes of *T. b. aureiventris*, *convexus* is less cinnamon, and more blackish in color; none or very little (gold-color) on under side. Skull: Smaller throughout and flatter; rostrum much more depressed and shorter; auditory bullae more inflated; no comparable enlargement of union of jugal and zygomatic process of maxillae; zygomatic arch heavier, especially in region of jugal, and wider posteriorly rather than anteriorly; interpterygoid space "V"-shaped rather than lyre-shaped; foramen magnum quadrangular as opposed to oval; upper incisors smaller, shorter and more recurved.

T. b. convexus differs from topotypes of *T. b. nesophilus* as follows: Size smaller throughout; color much lighter throughout; rostrum shorter, heavier and much more depressed; zygomatic arch shorter, heavier (and not so flaring); jugal heavier and shorter; brain case more inflated; upper margin of supraoccipital more developed as a crest rather than a plate; interparietal not as uniformly triangular shaped; upper incisors shorter and more recurved; palatal pits deeper; foramen magnum quadrangular as opposed to ovale; auditory bullae more inflated.

Comparatively *T. b. convexus* differs from topotypes of *T. b. albicaudatus* in being much lighter in color throughout; tail uniformly light colored without white caudal half as in *albicaudatus*; claws on front feet weaker. Skull: Smaller, flatter and more compact; rostrum shorter, heavier and more strongly depressed; upper incisors shorter and more recurved; zygomatic arch shorter and heavier; jugal bone more massive; looked at from below the space enclosed within the zygomatic arch shows the same differences as noted in the comparison with *T. b. tivius*; auditory bullae actually smaller,

but more inflated ventrally; foramen magnum quadrangular as opposed to oval; mandibular fossae larger.

Among named races of *Thomomys bottae*, *convexus* is closest geographically to *tivius*, but differs from topotypes of it as follows: Size slightly larger; color much lighter; no gold color on underside. Skull: While nearly of the same dimensions, the skull of *convexus* is much heavier throughout; average weights of series of skulls of males and females show: *tivius* males, 1.6 grams; females 1.2 grams; *convexus* males, 2.4 grams; females 1.6 grams; rostrum broader and much more depressed; upper incisors shorter, heavier, and more recurved; zygomatic arch much heavier throughout; jugal heavy as contrasted with weak; looked at from below the space enclosed within the zygomatic arch in *convexus* is more nearly quadrangular while that of *tivius* is triangular, and the anteriolateral angle in *convexus* is more nearly a right angle as opposed to obtuse; mandibular fossae larger; auditory bullae more inflated; palatal pits larger and deeper; alveolar length of upper molar series longer; molars larger; hamulae of pterygoids much heavier; foramen magnum more uniformly quadrangular.

Remarks.—These gophers were taken in the sand dunes at the eastern margin of Clear Lake in Delta Valley, Utah. The burrows were numerous in the areas where the sand was trapped by salt grass (*Distichlis stricta*). The animals had invaded the sand dunes proper only when they supported a growth of salt grass. Burrows were found from the upper limits of the salt grass on the dunes, down practically to the water's edge. Some of the burrows had actually been flooded because of fluctuations in the level of the lake. Those burrows right at the water's edge that were habitable at all were still occupied, even though many of them were so wet that the walls collapsed at the slightest touch. In addition to the actual flooding, the desertion might be due to the lack of mechanical support for the burrows.

Specimens examined.—17 skins and skulls from the type locality (all in collection of Museum of Zoology, University of Utah, Salt Lake City, Utah).

***Thomomys bottae minimus*, subsp. nov.**

Type.—Male adult, skin and skull, No. 263942, U. S. National Museum (Biological Survey Collection); Stansbury Island, Great Salt Lake, Tooele County, Utah; June 25, 1938; collected by W. H. Marshall; original No. 141.

Range.—Known only from the type locality.

Diagnosis.—Size small (see measurements); tail relatively long. Color: Upper parts Pinkish Buff, darker on head; under parts Pale Pinkish Buff; (capitalized color terms according to Ridgway, Color Standards and Color Nomenclature, Washington, D. C., 1912); front and hind feet white; nose, chin and post auricular patches black. Skull: Long, slender and nearly devoid of ridges; brain case moderately inflated; interparietal quadrangular; zygomatic arches widest in temporal region but neither wide-spreading nor angular; zygoma weak; angle between zygomatic process of maxilla and side of rostrum obtuse; nasals straight, and nearly truncate posteriorly; extension of premaxillae posterior to nasals great; lacrimal processes small and peg-like; auditory bullae moderately inflated; palatal pits deep;

rostrum short but narrow; interpterygoid space moderately lyre-shaped; dentition weak; upper incisors narrow.

Measurements.—The average and extreme measurements of 2 adult males and 2 adult females from the type locality are, respectively, as follows: Total length, 184 mm. (189–179), 178 (181–175); length of tail, 60 (64–55), 56 (58–54); length of hind foot, 25 (26–24), 25 (25–24); length of ear, 3 (3), 3 (3); basilar length of Hensel, 30.7 (32.8–28.7), 28.2 (28.2–28.1); greatest length of nasals, 11.3 (12.5–10.2), 10.6 (10.8–10.4); zygomatic breadth, 21.3 (22.4–20.2), 19.7 (19.7–19.6); mastoidal breadth, 18.7 (19.6–17.8), 17.4 (17.7–17.1); least interorbital breadth, 6.4 (6.4–6.3), 6.1 (6.1); alveolar length of upper molar series, 7.4 (7.6–7.3), 7.0 (7.0); extension of premaxillae posterior to nasals, 2.5 (2.5), 2.3 (2.3); length of rostrum, 13.9 (15.0–12.9), 13.1 (13.2–13.0); breadth of rostrum, 7.5 (7.9–7.0), 6.7 (6.8–6.5).

Comparisons.—Among named races of *Thomomys bottae*, *Thomomys bottae minimus* is most close related to *Thomomys bottae nesophilus* but differs from the type series of the latter form as follows: Color: A trifle lighter throughout; post auricular patches darker in color and smaller in extent; nose, chin and cheeks much darker. Size: Remarkably smaller in all measurements; claws on front feet much shorter and weaker; tail relatively longer. Skull: Smaller in all measurements; slender and narrow as opposed to wide and robust; zygomatic arches not as wide-spreading and weaker; zygomatic process of maxilla narrower and not as angular; brain case more inflated; interparietal quadrate as opposed to triangular shaped; lambdoidal region more developed as a crest than a plate; extension of premaxillae posterior to nasals relatively greater; palatal pits deeper; auditory bullae actually smaller but relatively larger and more inflated ventrally; dentition weaker; upper incisors shorter and narrower.

Remarks.—The author is indebted to the United States Department of Agriculture, Bureau of Biological Survey, and especially to Major E. A. Goldman for the opportunity of studying these animals and naming this form.

Stansbury Island is situated in the southwest corner of Great Salt Lake, and during the past years of drought (1932–1937) has been connected with the mainland. The intervening territory consists of a white salt flat. This same condition also exists to the east in the case of Antelope Island. This same condition has undoubtedly existed in the past during fluctuations of the lake level. Both of these islands have endemic gophers, which signifies that these dry, barren, white salt flats are as efficient a barrier to these animals as water. Stansbury Island is the northward projection out into the lake of Stansbury Mountains, and the gophers not yet described from these mountains show the closest affinities to *Thomomys b. minimus* of any of the mainland forms. On the other hand *Thomomys bottae nesophilus* shows its affinities with the form *albicaudatus* to the east of the lake.

Specimens examined.—Five, all from the type locality (all in the U. S. National Museum, Biological Survey Collection).

Contribution from the Museum of Zoology, University of Utah, Salt Lake City, Utah, and Museum of Vertebrate Zoology, University of California, Berkeley, California.